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## पाम फैटी एसिड — विशिष्टि

( पहला पुनरीक्षण )

## Palm Fatty Acids — Specification

( First Revision )

ICS 71.080.40

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Price Group 5

## FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Oils and Oilseeds Sectional Committee had been approved by the Food and Agriculture Division Council.

The palm fatty acids are obtained by the hydrolysis of palm oil. Palm oil is obtained from the fleshy mesocarp of the palm fruit (*Elaeis Guineensis*). Palm fatty acids consist of saturated and unsaturated fatty acids in approximately equal amounts, palmitic and oleic acids being the main fatty acids.

Palm fatty acids are mainly used in the soap and oleochemicals industry. This standard was originally published in 1987. This first revision, has been brought out to incorporate the specifications for a third grade of palm fatty acids obtained by distillation of palm fatty acid distillate, revise the moisture content requirement of Grade 1 and specify the fatty acid composition for palm fatty acids, which has been adopted from the *Codex Standard for Named Vegetable Oils (CODEX-STAN 210 - 1999)*. It has been clarified in the scope that this standard does not cover the derivatives of palm fatty acids such as hydrogenated palm fatty acids, stripped palm fatty acids and other fractionally distilled palm fatty acids derived from palm oil.

The composition of the committee responsible for the formulation of this standard is listed in Annex B.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 2022 'Rules for rounding off numerical values (*second revision*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

*Indian Standard*  
**PALM FATTY ACIDS — SPECIFICATION**  
*( First Revision )*

## 1 SCOPE

**1.1** This standard prescribes the requirements, sampling and tests for palm fatty acids.

**1.2** This standard does not cover the derivatives of palm fatty acids such as hydrogenated palm fatty acids, stripped palm fatty acids and other fractionally distilled palm fatty acids derived from palm oil.

## 2 REFERENCES

The standards listed below contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards listed below:

| <i>IS No.</i>                            | <i>Title</i>   |
|--|--|
| IS 548                                   | Methods of sampling and test for oils and fats   |
| (Part 1/Sec 2) : 2021                    | Sampling, physical and chemical tests, Section 2<br>Physical and chemical tests  |
| (Part 3/Sec 1) : 2021                    | Advanced instrumental methods, Section 1<br>Determination of fatty acid profile  |
| IS 1070 : 1992                           | Reagent grade water — Specification ( <i>third revision</i> )  |
| IS 1448 (Part 21) : 2019/ISO 2719 : 2016 | Methods of test for petroleum and its products: Part 21 Determination of flash point — Pensky-Martens closed cup method ( <i>fourth revision</i> ) |

## 3 GRADES

The material shall be of three grades, namely:

- a) Grade 1 – Distilled grade obtained from palm oil;
- b) Grade 2 – Undistilled grade obtained from palm oil; and

- c) Grade 3 – Distilled grade obtained from Palm Fatty Acid Distillate (PFAD).

NOTE — Palm Fatty Acid Distillate (PFAD) is a by-product obtained during the physical refining of palm oil to produce refined, bleached and deodourised (RBD) palm oil. The requirements of palm fatty acid distillate are not covered in this standard.

## 4 REQUIREMENTS

### 4.1 Description

Grade 1 and Grade 2 palm fatty acids shall be produced by splitting the oil obtained from the fleshy mesocarp of the fruit of the oil palm (*Elaeis Guineensis*) tree. Grade 1 material shall have been further subjected to vacuum distillation. Grade 3 shall be obtained by distillation of Palm Fatty Acid Distillate (PFAD).

**4.1.1** If solvent is used in the manufacture of oil or fatty acid, a minimum flash point requirement specified in Table 1 will be operative.

**4.2** The material shall be free from sediments, suspended and other foreign matter and separated water. Grade 1 and Grade 3 shall be clear and transparent on melting above 50 °C.

**4.3** The material shall also comply with the requirements given in Table 1.

**4.4** The material shall comply with the fatty acid composition specified in Table 2, when tested as per IS 548 (Part 3/Sec 1) or any other validated international method.

## 5 PACKING AND MARKING

### 5.1 Packing

The material shall be supplied in suitable containers as agreed to between the purchaser and the supplier. The packaging material shall not affect the quality of the product/material being packed.

### 5.2 Marking

**5.2.1** The containers shall be securely closed and legibly and indelibly marked with the following information:

- a) Name and address of manufacturer and recognized trade-mark, if any;

- b) Name and grade of the material;
- c) Net quantity of the material;
- d) Batch or lot number in code or otherwise;
- e) Month and year of manufacture;
- f) Expiry date (Month and Year); and
- g) Any other information required under the *Legal Metrology (Packaged Commodities) Rules, 2011*.

### 5.2.2 BIS Certification Marking

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act, 2016* and the Rules and Regulations framed thereunder, and the product(s) may be marked with the Standard Mark.

**Table 1 Requirements for Palm Fatty Acids**  
(Clause 4.3)

| Sl No. | Characteristic   | Requirement For |           |           | Method of Test,<br>Ref to       |
|--------|--|-----------------|-----------|-----------|---------------------------------|
|        |  | Grade 1         | Grade 2   | Grade 3   |                                 |
| (1)    | (2)  | (3)             | (4)       | (5)       | (6)                             |
| i)     | Moisture, percent by mass, <i>Max</i>                              | 0.2             | 1.0       | 0.3       | 6 of IS 548 (Part 1/Sec 2)      |
| ii)    | Saponification value   | 202 - 215       | 202 - 215 | 200 - 215 | 16 of IS 548 (Part 1/Sec 2)     |
| iii)   | Acid value shall not differ from saponification value by more than | 4               | 12        | 4         | 8 of IS 548 (Part 1/Sec 2)      |
| iv)    | Iodine value   | 47 - 58         | 47 - 58   | 47 - 58   | 15 of IS 548 (Part 1/Sec 2)     |
| v)     | Mineral acidity  | Nil             | Nil       | Nil       | A-1                             |
| vi)    | Ash, percent by mass, <i>Max</i>                                   | 0.1             | 0.5       | 0.1       | A-2                             |
| vii)   | Unsaponifiable matter, percent by mass, <i>Max</i>                 | 0.3             | 1.0       | 1.2       | 9 of IS 548 (Part 1/ Sec 2)     |
| viii)  | Titre, °C  | 44 - 46         | 42 - 46   | 44 - 48   | 13 of IS 548 (Part 1/Sec 2)     |
| xi)    | Colour, 1-in cell, <i>Y + 5R, Max</i>                              | 10              | —         | 10        | 14.1 of IS 548 (Part 1/Sec 2)   |
| x)     | Flash point, °C, <i>Min</i>  | 100             | 100       | 100       | IS 1448 (Part 21) <sup>1)</sup> |

<sup>1)</sup>Procedure C given in IS 1448 (Part 21) is applicable for determination of flash point of fatty acids.

**Table 2 Fatty Acid Composition of Palm Fatty Acids**  
(Clause 4.4)

| SI No. | Fatty acid | Percentage  |
|--------|------------|-------------|
| (1)    | (2)        | (3)         |
| i)     | C6 : 0     | ND          |
| ii)    | C8 : 0     | ND          |
| iii)   | C10 : 0    | ND          |
| iv)    | C12 : 0    | ND - 0.5    |
| v)     | C14 : 0    | 0.5 - 2.0   |
| vi)    | C16 : 0    | 39.3 - 47.5 |
| vii)   | C16 : 1    | ND - 0.6    |
| viii)  | C17 : 0    | ND - 0.2    |
| ix)    | C17 : 1    | ND          |
| x)     | C18 : 0    | 3.5 - 6.0   |
| xi)    | C18 : 1    | 36.0 - 44.0 |
| xii)   | C18 : 2    | 9.0 - 12.0  |
| xiii)  | C18 : 3    | ND - 0.5    |
| xiv)   | C20 : 0    | ND - 1.0    |
| xv)    | C20 : 1    | ND - 0.4    |
| xvi)   | C20 : 2    | ND          |
| xvii)  | C22 : 0    | ND - 0.2    |
| xviii) | C22 : 1    | ND          |
| xix)   | C22 : 2    | ND          |
| xx)    | C24 : 0    | ND          |
| xxi)   | C24 : 1    | ND          |

NOTE — ND = Non-Detectable, defined as  $\leq 0.05$  percent

## ANNEX A

[Table 1, *Sl No.* (v) and (vi)]

## TEST FOR MINERAL ACIDITY AND ASH

## A-1 TEST FOR MINERAL ACIDITY

## A-1.1 Quality of Reagents

Unless specified otherwise, pure chemicals and distilled water (*see* IS 1070) shall be employed in tests.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the results of analysis.

## A-1.2 Reagents

**A-1.2.1 Methyl Orange Indicator** — 0.05 percent (*m/v*) solution

**A-1.2.2 Light Petroleum Ether** — (60 °C/80 °C)

## A-1.3 Procedure

Measure 10 ml of the melted sample into a separating funnel and shake intimately with three successive 10 ml portions of hot water. The temperature of the hot water should be more than the melting point of palm fatty acids. Combine the aqueous extracts, transfer to another separating funnel and remove traces of fatty acids in the water by extraction with light petroleum ether. Test the aqueous extract so obtained with a few drops of methyl orange indicator.

**A-1.4** The material shall be taken to have satisfied the requirements of the test if the indicator does not show acid reaction.

## A-2 DETERMINATION OF ASH

## A-2.1 Apparatus

## A-2.1.1 Platinum Crucible

**A-2.1.2 Desiccator** — containing an efficient desiccant, such as fused calcium chloride

## A-2.2 Procedure

Weigh accurately about 10 g of the air-dried material into a platinum crucible which has been previously dried, cooled in the desiccator and weighed. Heat the crucible over a low flame and ignite the contents gently. Incinerate the residue in a muffle furnace at  $(550 \pm 10)$  °C until free from carbon. Cool the crucible in a desiccator and weigh. Repeat the above procedure of heating, cooling and weighing until the difference between two successive weighings does not exceed 1 mg.

## A-2.3 Calculation

$$\text{Ash, percent by mass} = \frac{100 m}{M}$$

where

$m$  = mass, in g, of the ash; and

$M$  = mass, in g, of the material taken for the test.

**ANNEX B**  
(Foreword)

**COMMITTEE COMPOSITION**

Oils and Oilseeds Sectional Committee, FAD 13

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